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Bhutas
Some Inter-related Themes of Indian Cosmology

P.K. Mukhopadhyay

The expression *Bhuta* is often translated in English as element. We shall see later that these two expressions are not exact synonyms. Keeping that in mind we may for ordinary purposes use the two words interchangeably. The *Bhutas* or the elements constitute one of the most primitive fields of human inquiry known as cosmology. Interest in the themes of this field is most pervasive and abiding. Hardly there is a culture which can claim maturity but did not develop quite early in its history cosmology of some form or other. At the same time it is still one of the developing areas of one of the most developed branches of science. Cosmology has proved itself to be one of those areas of human knowledge which can be said to be a meeting point of speculative philosophy and experimental science, traditional wisdom and modern discovery, theology and mythology on the one hand and secular positivistic inquiry on the other. Two of the most ancient and developed civilizations of human history — the Vedic and the Hellenistic — gifted to the world very rich cosmological ideas and insights. In none of these two cultures science and philosophy seem to be as sharply distinguished as in modern European culture. While the Hellenistic culture was later on completely overthrown or overtaken by or absorbed into the culture of Christianised Europe, the Vedic culture is still maintaining its separate identity. But the cosmological ideas of the Greeks are far more widely known than the contributions the Indian seers and philosophers made in this field. Time has come when the scientists with the right frame of mind may discover useful cosmological insights which did not receive due emphasis in the hands of teachers of Indian philosophy and *Puranas*. Even if much meaningful use of the cosmological ideas of the Indian scholars of the classical age cannot be made, it may be found immensely interesting how in those days the scholars discovered, formulated and tackled the relevant questions and if we can add anything of significance along that line or find any constructive criticism to offer. It is in itself a very rewarding task to see if and how far we can integrate

modern discoveries and advances in the field of knowledge into the everchanging and everdeveloping framework of thought which is still continuous with the classical thinking.

In different types of literature of the Vedic culture one finds discussions on or mention of *bhutas*. But we do not have a neat name like cosmology. *Srstiprakarana* (portion of text devoted to the theme of creation) is a necessary part of the type of literature called *Puranas*. Though in almost every system of *darsana* (roughly, philosophy) and in most text books of *darsana* the topic of *bhuta* finds a place, yet it does not seem to be a necessary part of *darsana* in the same sense of the term in which it is a necessary part of *Puranas*. Every distinguishable system of philosophical thought has definite view about *bhuta* and *sarga*. Even those Indian schools of thought which are non-Vedic or anti-Vedic are no exception. In this paper I shall present some of the Vedic cosmological ideas. But for this purpose I shall not reproduce accounts which are available in the *Vedas*, *Upanisadas*, *Puranas* or *Tantras* — which constitute that division of the corpus of the Vedic literature which may be called *agamic* and which is more strongly exhortatory and practical. I would rather draw on accounts available in the other division of the Vedic literature which may be called analytical and empirical and which is more strongly theoretical. One finds faithful elaborations and creative use of the Vedic thoughts and insights in the classical analytical literature which are not direct commentaries on the *Vedas* and *Upanisads* but are works of those philosophical schools which are known as *astika* school because they accept the *Veda* as source of knowledge and truth. Compared to these philosophical works the *Vedas*, the *Puranas* and *Tantras* and even the *Upanisads* often leave their analytical theoretical contents on many matters hidden; this one does not and perhaps cannot hope to find in independent historical and even analytical works of those recent scholars who do not belong to the tradition of the believing theoreticians and practitioners of the Vedic culture. This is bound to happen in every old civilization which in course of history has come in contact with other civilizations and myriad influences from outside as well as stress and strain from within. One respect in which the analytical works of philosophical literature are greater aid in understanding some concepts of the *Vedas* is that in such literature the relevant concept is presented and discussed in its proper perspective of a network of other concepts. The concept of *bhuta* for example is found much more clearly in its relationships to such other concepts as *kala* (time), *dik* (space), *samkhya* (number), *kriya* including all form of physical motion and movement, *karanata* (causality), *sarga* (creation), 'chaos' or a state prior to or after the creation) and the like. It is in the context of these other concepts or in relation to them that one can hope to discover the rich theoretical potentiality of the concept of *bhuta*. Such analytical elaborations of ancient ideas or of views adumbrated in ancient literature go generally by the name philosophy considered as fairly good synonym for the Sanskrit term *darsana*. One difficulty is it

seems that in recent times particularly in the community of British and American philosophers it is believed that philosophy is necessarily non-science or pseudo-science, it is taken as speculative (in somewhat derogatory sense perhaps) or analytic whereas science, at least natural science, is necessarily empirical and factual. Besides in European theoretical tradition it seems that cosmology is either scientific or mythological. But just as science-philosophy dichotomy is generally unknown in India at least in the sense in which it is familiar in contemporary West so also the account of *bhuta* and *sarga* we are going to derive from or reconstruct along the line of classical Indian philosophical schools is not mythological; if it is not scientific it is philosophical. It may incidentally be noted that to translate *Purana* as mythology is inaccurate, similarly inaccurate it seems to translate the word science as *vijnana*. In this sense it is sometimes used in modern Indian languages as Bengali but not in classical Vedic literature. As translation of modern European science the word *vijnana* does not seem to have any currency in old literature.

Philosophical schools or *darsana sampradayas* of India including the Vedic or *astika* schools differ more in their account of *sarga* than in their theory of *bhutas*. There is a large amount of agreement also. In the second section I shall note some of these points of similarities and dissimilarities between some Indian schools of thought. In the next section I shall reconstruct some of the more specific and salient features of the old *nyaya* and modern *nyaya-vaisesika* schools which are best known for their rigorous analytical approach at least to theoretical questions.

Vedanta paribhasa is a widely read elementary text book of *Advaita Vedanta*. First two lines of the invocation verse with which the book begins read:

(I) *yadavidyavilasena bhutabhautika srstayah*
tamnaumi paramatmanam saccidanandavigraham.

Tattvacintamani of Gangesopadhyaya is the major source book of *nyaya* which marked the beginning of modern age in the history of *nyaya* school. This book makes many references to God or *Isvara* at different places and stages of its development. Among these are

(II) a. *yah srstisthitivilayakarmani tanute*
and
b. *jagatnirmatrpurusadhaureyasiddhi*

The first of these passages occurs in the invocation verse with which *Tattvacintamani* begins and the second occurs in the first sentence of the last section of the second or *Anumana* part of the book in which Gangesa developed the *nyaya* analytical theory of inference. In (I) or according to the representative view of the *advaita vedanta* in

the matter *srsti* or creation of the universe has within its scope both the *bhutas* or the elements and *bhautika*, meaning things created out of *bhutas* or elements. In other words (I) bears evidence to the fact that according to some Indian schools of thought creation is of two types (i) creation of (all or some) *bhutas* themselves and (ii) creation of the *bhautikas*. One common point between the views (I) and (II) is that creation of anything presupposes existence of some stuff which is either the constituent and continuent cause of the created or some other kind of cause of it. The distinction between these two types of cause is not very important so long we confine ourselves to what may loosely be called material creation but what is more strictly speaking creation of matter, whether at the macro level as when a clay jar is produced, or at the micro level as when first two units of some *bhuta* are combined and a matter having the simplest structure is created. Unless stated otherwise, by *bhautika srsti* we shall mean here the creation of matter out of *bhutas* or out of some material parts (*avayavas*) which they are themselves created out of *bhutas* or of material parts which are and so on. That *bhautika srsti* presupposes ultimately the existence of *bhutas* is admitted by the advocates of both (I) and (II). Since it is also admitted that creation of anything presupposes some pre-existing stuff, the followers of the view (I) would not only accept that the creation of type (ii) presupposes ultimately the existence of *bhutas*, they would also admit that the *bhutas* are not the most basic or primordial stuff of creation. For creation of type (i) there must be some more basic form of matter than the *bhutas*. We owe it to the *Samkhya* philosophers that this more basic stuff out of which the *bhutas* are themselves created is *tanmatra*. Corresponding to five types of *bhutas* there are five *tanmatras*. Important point to note is that the followers of the views (I) and (II) do not disagree as to the denotation of the term *bhuta*. *Samkhya* and *Advaita Vedanta* philosophers for example do not mean to say that the upholders of the view (II) especially the *Naiyayikas* are wrong, when they think that *bhuta paramanus* are not created; they too are created and as such are not the basic stuff of creation or *bhuta* in the true sense of the term; and the basic stuff are the *tanmatras* out of which are produced both the *bhutas* and *bhautika* things. To put it otherwise, the advocates of the view (I) do not mean to say that *paramanus*, say, are not *bhutas* but *tanmatras* are *bhutas*. They on the other hand admit *bhutas*, but since in their opinion these *bhutas* are also created substances and every created thing presupposes existence of more basic stuff they admit still simpler constituents of creation viz., *tanmatras*.

Be that as it may. Unlike the *Samkhya* and *Advaitavedanta* philosophers who subscribe to the view (I), the *Naiyayikas* and the *Vaisesikas* understand by *srsti* type (ii) creation only. This difference among the *astika* schools may be taken as difference in interpretation of relevant passages of the *Veda* and also of other texts and passages of *agamic* literature. Whereas in *agamic* literature *sarga* has been talked about and almost all the different views about *sarga* later developed by the theoreticians in the analytical literature were adumbrated, philosophers of the group unholding the view

(I) came to believe that *srsti* necessarily means *bhautika srsti* or creation ultimately out of the *bhutas*. While the *Advaitavedantins* believe that these *bhutas* are also created, the *Samkhya* philosophers maintain that the *tanmatras* out of which the (*mahabhutas* are created did not themselves exist there always, not at least in the form of *tanmatras*.

Thinkers upholding the views (I) and (II) however agree among themselves on one point and that is this. There is or has been such a thing as creation. Even though in matters of technical details creation is to be understood differently. These philosophers agree that the universe or *jagat* was created and this creation of *jagat* as a whole is in addition to such creation as manufacturing of a clay jar by a potter or conceiving of a human baby. But there is a third view (III) *na kadapi anidrsam jagat*. According to this view, advocated by some *Mimamsaka* philosophers, there never had been a state when no universe was there or *jagat* was yet to be created. This difference between the two groups of philosophers lead to another difference among them. Their commitment to the view that the universe was created at a certain point of time committed the advocates of the views (I) and (II) by implication to the view that there had been a state prior to the state of creation of the universe. This is the state of *pralaya* or roughly speaking, chaos. The upholders of the view (III) consistently with their other views deny a state of cosmic *pralaya* — a state marked by future possibility of *jagat* as a whole. Those who believe in a state of cosmic *pralaya* often believe in cycles of creation and chaos. In their opinion every cosmic creation is preceded necessarily by a state of cosmic *pralaya*; they also believe that all but one state of cosmic creation ends with the advent of a new state of cosmic *pralaya*. The state of cosmic creation, which ends as it must but does not end in such cosmic *pralaya* as is marked by the future possibility of creation, is known as last creation, and the state of *pralaya* in which this creation terminates is called *mahapralaya*, which is defined as or is marked by the absence of every created positive thing. In the opinion of the majority of Indians though the cycles of cosmic creation and dissolution has a final termination, there is no first beginning. Ignoring this point which is of great theoretical importance for the Indian thinkers some Western physicists of recent time tend to argue what the Indians call the cycles of *srsti* and *pralaya* or cosmic creation and cosmic dissolution is essentially the same thing or the anticipation of the energy — matter exchanges of quantum physics. For our present purpose it is not necessary either to support or criticize the attempt to find a link between some classical thoughts of India and some discoveries of modern science. I have written something elsewhere about what should better be our stand in such matters. It may, however, be reiterated that the usual way in which cosmological accounts are classified, viz., that such account is either scientific or mythological — does not seem to be adequate. In fact the cosmological account we are going to reconstruct following the cue to be found in the analytical literature of the Indian philosophical school of *Nyaya* is not only not mythological, it is not even just speculative. It is not for that matter that we know today

as scientific cosmology of astrophysics. The *nyaya* theory of *Bhautika srsti* is scientific in the sense of not being purely speculative. It is better to call it analytical in a broad sense. For without ceasing to be rigorously analytical it successfully combines in it various strands and considerations such as theological-anthropomorphic, structural-analytical and empirical-causal.

The first point to note about the *nyaya-vaisesika* theory of *bhautika srsti* or cosmic creation is that it is not a theory of material or physical creation in the narrow sense of the term. It includes creation of least complex matter such as a dyad formed out of just two simplest and smallest units of matter and also things like a clay jar and its colour on the one hand and such organic matter as a human body on the other. Further the process of creation includes both physical and chemical transformations. The second point to note is that the ultimate stuff and material component of *bhautika srsti* or the *bhutas*, are not theoretical abstractions or constructs but are believed to be actual existents. Among many actual and possible questions relating to the *bhutas* two deserve to be especially discussed. In the first place the two notions and expressions of *bhuta* and *paramanu* are to be distinguished. This is also very much necessary if one wants to introduce the English expression element as synonym of either or both. It is required of a *bhuta* that it should be structurally simple (*suksma* and *niravayava*) unit of matter (*jada dravya*); it is not further needed that it should be the smallest or infinitely small (*paramanu-rupa*). Nor it is a part of the meaning of the term *bhuta* that it must be a constituent part of some actual or possible created matter in the sense in which the constituent material part of a created matter is necessarily smaller in dimension (*parimana*) than the matter thus created. Thus structural simplicity of a *bhuta* is not to be confused with infinitesimally small dimension of it; it is to be understood rather as unanalysability. A *bhuta* cannot be structurally, physically or conceptually broken into further simpler units of matter (*avayava*).

The second important point for discussion in the *nyaya* theory of *bhautika srsti* is how *bhutas* combine and what sort of combination of what *bhutas* can amount to creation. Unlike philosophers of some other Indian school the *naiyayika*s hold that *bhutas* of anyone of the five types cannot combine with the *bhutas* of any other type; at least one *bhuta* of one type, say, *prthivi* or earth cannot combine with another *bhuta* of another type, say, water or *ap* in a way in which two *bhutas* of one type, say, of earth or water can combine. This tenet of *nyaya-vaisesika* school has a far reaching consequence; however complex internally and structurally a particular material substance may be, it is *eka bhautika*. But every created substance must have more than one or *aneka* material constituents and hence ultimately *aneka bhuta* as its constituents. If thus every created matter must contain *aneka bhutas* and also must necessarily be *eka bhautika*, then the *bhutas* must be distinguished both quantitatively numerically as well as qualitatively. *Akasa* is a *bhuta* and it is numerically one. It, however, differs

qualitatively from any single *bhuta* of any one of the other four types of *bhutas*. Such qualitative difference is not there between any two *bhutas* of the same single type. Thus whereas any two *bhutas* of one qualitative group or kind such as *prthivi* or *tejas* are merely numerically quantitatively different, two *bhutas* of two qualitatively different kinds such as *prthivi* and *tejas* differ both numerically and qualitatively. In other words there necessarily obtains quantitative and numerical difference between two *bhutas* irrespective of whether or not they belong to the same class, and qualitative difference obtains only when they are of two different kinds. Be that as it may, one necessary implication of the view, that all created matter is *eka bhautika*, is that not only one element or *bhuta* cannot be changed into another *bhuta*, but no substance of one *bhuta* can be changed into substance of another *bhuta*. What it meant for the project of alchemy seemed to have been well understood in the classical period of *nyaya* also. On this theory it becomes easy to classify substances into various *bhuta* classes. Each substance belongs exclusively to one of the five *bhuta* classes; it is *prthivi* or *parthiva* or it is *tejas* or *taijasa* and so on. But those who believe that almost as a rule a created matter whether organic or inorganic is *aneka bhautika*, in fact *pancabhautika*, we need a principal to decide when a *pancabhautika* substance is *parthiva* and when it is *taijasa* and the like. To simplify the matter one principle is that of preponderance; a created matter is grouped in that *bhuta*-class, the number of constituent of which class is the greatest or most preponderant. Exact measure of preponderance has also been worked out in the theory of *Pancikarana* about which we have written elsewhere. A *pancabhautika dravya* is *parthiva*, as fifty per cent of its constituent *bhutas* or one part of it, if it is evenly broken into two matching parts, is *prthivi*.

The theory of *eka bhautika dravyas* of the *naiyayikas* should be carefully understood. The *naiyayikas* do not deny that a gross material body whether organic or inorganic does contain more than one kind of *bhuta* or *bhautika dravya* as constituent. Thus a normal and common material substance of the macro world contains usually all the five *bhutas*. So far in a loose sense all types of *bhuta* are found in a state of conjunction or combination in the body of one gross substance. But suppose in such a substance *S* there are two *prthivi* or *parthiva* elements and also constituents which belong to other four *bhuta* or *bhautika* class, how are we to decide whether the substance is *parthiva* or *jaliya* and the like? A human body is a case in point; it certainly has as constituent water, air, fire, *akasa* and *prthivi*. How does a *naiyayika* decide that the organic matter called human body is *parthiva*? We shall return to this soon. But we must first clarify a bit further what type of material or physical substance the *bhutas* are and what are other types of substances.

All the actual and possible things that may be found to be there in the universe or constitute it have been broadly divided into seven fundamental kinds or seven *padarthas* by the *naiyayikas*. Of these the first is called *dravya* or substance which again

has been subdivided into nine classes: *ksiti* (earth), *ap* (water), *tejas* (fire), *marut* (air), and *vyoma*, *kala* (time), *dik* (space), *atma* (soul), and *manas* (internal sense-organ). There are various ways or principles of classification according to which these substances may be classified or grouped. By choosing different principles at the same time we may even produce cross divisions of these substances. One important principle according to which these are distinguished into different groups is whether or not a substance is available in a form in which it is created. Each one of these nine substances is available in eternal or uncreated form. But the first four are also found in created form. The fact that the first four substances are available both in created and uncreated forms and that in their uncreated form they are not only partless but can themselves form parts of created substances make this distinction most important from the point of view of the theory of *bhautika srsti*. In their uncreated or eternal form these substances are known as *paramanu*. So whereas there are five *bhutas*, there are only four types of *bhuta paramanus*. The fifth *bhuta* or *akasa* is only available in the eternal and uncreated form. Hence so far as this *bhuta* is concerned there is no distinction between *nitya* and *janya*. The other *bhutas* are available in the *nitya* or *paramanu* form and in the *janya* or created form. Strictly speaking no *bhuta* is itself caused.

A created substance is necessarily created ultimately out of the (*nitya*) *paramanus* of one of the four *bhutas*. When a substance is thus created we call it an instance of *janya bhuta* of the respective type. *Eka bhautika* substances are really the only *janya bhutas*. Now since every *janya dravya* is *eka bhautika* and since the model of creation is combination of *paramanus* of respective type, there must be admitted indefinite number of *paramanus* of each of the four types. The number of *paramanus* to be admitted in the case of any single *bhuta* or substance of anyone of the first four is related to such other questions as whether the *paramanus* can really be partless, and this in its turn is related to the question whether the *paramanus* can really combine to create a *bhautika* substance of the same *bhuta* kind. In addition to these we shall not have a fully worked out rational and analytical theory of *bhuta* and cosmic creation till we can clarify the nature of the combination, its effectiveness and possibility which is supposed to create a whole universe out of tiny bits of matter known as *bhutas*. One thing is clear: if *bhutas* are to combine to produce a *bhautika* substance and only the substance that can be produced is *bhautika*, every *bhuta* must be an actual or possible constituent of some *bhautika dravya*. But by the principle that *paramanus* of different *bhutas* cannot combine, combination of *paramanus* or *bhutas* means necessarily combination of *paramanus* of one *bhuta* only. Unless therefore a *bhuta* is numerically many or at least two, it cannot enter into effective combination that can explain creation. A *bhuta*, which is numerically one, cannot participate in any *bhautika srsti* as constituent of created substance. *Akasa* or *vyoma* for this reason cannot be the constituent of any *bhautika* substance and it cannot combine with any substance in

the sense or in the way in which two *paramanus* of anyone of the first four *bhutas* can combine. But for all that, *akasa* is counted among the *bhutas* and it is also admitted to be capable of combining with other *bhutas* and substances in some sense.

Now the uncreated *bhutas* which admit of numerical difference and are numerically many are *paramanu* in nature. What about the *bhuta* which is even numerically one? The *naiyayikas* hold that this *bhuta* is infinitely vast or is ubiquitous. By contrast the *paramanus* are minutest parts of *bhautika* substances. Thus while part of the meaning of *paramanu* is that it is the simplest material constituent or *avayava* of the smallest ever substance to be produced, being material part of a substance is no part of the meaning of *bhuta*. *Bhutas* are therefore available in two forms, infinitely large (*vibhu rupa*) and infinitely small (*paramanu rupa*); the former type of *bhuta* cannot be constituent of any created matter also because a constituent matter must be smaller than the matter it constitutes. But since *akasa* is not smaller than any substance it cannot be a constituent matter. Nor for that matter can it be a constituted substance; a constituted matter must ultimately be the result of the combination of numerically distinct *bhutas* of the same kind, i.e., *paramanus* of the same single *bhuta*. But since there are no two even numerically distinct *akasas*, there cannot be *janya akasa* constituted by smaller bits of *akasa*. All these matters of detail deserve to be separately discussed. But that is not possible within the limited length of hence I shall discuss as many of these points as possible together, though that is not the way to ensure clarity or accuracy; paradoxically enough attempt to save space in this way often makes certain amount of repetition unavoidable. The terminological clarifications achieved so far may be remembered. We cannot use interchangeably the two expressions of *bhuta* and *paramanu* and none of these expressions can be used as synonym of element. We shall see how inaccurate it is to translate *paramanu* as atom.

Paramanus of any one *bhuta* is believed to be indefinite in number. But whatever may be their exact total number it remains permanently fixed. The total number of *bhutas* is also fixed; we know the number is five. But the number of individual *bhautika* substances such as clay jars and of kinds of such substances, e.g., *ghata* or *sarira* (organic matter of, say, human body) is theoretically speaking infinite. Any two *bhautika* things and any two *paramanus* of two distinct *bhutas* differ both numerically and qualitatively. Two *paramanus* ,of any single *bhuta* differ only numerically. *Paramanus* are actual or possible constituents of some *bhautika* substance. The number of *paramanus* which constitute any given *bhautika* substance is finite. From this point of view the universe though created is not one *bhautika* substance as a clay jar is. For then the total number of *paramanus* in the universe would have been finite. The universe is regarded as the totality of effects including all the created substances, and ultimate material constituents total of all the created matters is *bhuta* including

bhuta paramanu the number of which is, we have seen, infinite. We shall soon return to the question why the number of any single created substance is indefinite rather than infinite. But let us first note another feature of the *paramanus* and the consequence of that so far as the theory of *bhautika srsti* is concerned.

Any two *paramanus* of the same or different *bhutas* are independent of each other. The same is true of any two *bhutas* also. Anyway, two *paramanus* may or may not stand combined; and even when they stand combined they do so contingently, i.e., they may fall apart again. The *paramanus* therefore can remain unrelated and once they come to be related they can become separated later; and once separated they can recombine. When two substances are contingently combined in this way the *naiyayikas* say they are combined or related by way of conjunction, i.e., the relation that binds together any two substances – whether two *paramanu bhutas* or two *bhautika dravyas* or two *abhautika dravyas* or any permutation or combination of them – thus contingency is called by the *naiyayikas samyoga*; we translate this as relation of conjunction. There are other relations like inherence the relata of which are not so contingently related. The contingent relation of conjunction presupposes that the terms to be related by its means must previously be in a state of disjunction. In other words this relation presupposes or implies a prior state of disjunction between the items which now stand conjoined. It is also true on *Nyaya* theory that any state of conjunction between any two substances must be followed by a state of disjunction or loss of at least effective conjunction.

Though there are no two sorts of conjunction yet we must distinguish between the conjunction which bind together two constituent substances – whether two *bhuta paramanus* or material parts or *avayava dravyas* constituted ultimately by the *bhuta paramanus* – within a single substance constituted by them from the conjunction which obtain between two substances which are not constituents of the same (gross) substance. At the macro level also we distinguish between the conjunction which hold together the threads of a piece of cloth and the conjunction that obtains between a book and a table if we happen to place the former on the latter. The threads are so conjoined as to bring into existence another substance with an identity of its own. Such substances are called *avayavin* and they alone have proper parts or *avayavas*. Where the conjunction between certain substances fail to bring forth an *avayavin* the conjunction accounts for there being a mere collection or heap of matter. When a conjunction or set of conjunctions is effective in bringing about an *avayavin* or *avayavi dravya*, that is, a new substance with its own identity, it is called effective conjunction or *dravyarambhaka samyoga*. But when the same *samyoga* or conjunction (same because as conjunction, all the conjunctions are the same) accounts for a mere collection we must distinguish it as ineffective. It is clear that here being effective means being causally effective or effective in bringing about a new single substance

rather than only a collection of a (the same) number of substances.

We are now in a position to answer a question which we left unanswered. On *Nyaya* theory every created substance is necessarily *eka bhautika* by which is meant that any such substance is created ultimately through effective conjunction of *paramanus* of one *bhuta* only. When in a gross created substance at the macro level, such as, say, an organic human body, we say all the *bhutas* are somehow present, what we mean is that in such a gross body different *bhautika* or created substances are present as parts not in the sense of *avayavas*. An organic body is not strictly speaking a single substance, nor again it is a mere collection of many unassorted substances. A body has a unity but not the identity of a single *avayavin*. What are ordinarily called parts of a body can hardly be said to be the *avayavas* of the body. Thus the eyes of a human body are not the *avayava* of the latter. For the eyes are *teja dravya* or belong to the class of substances made out of the *paramanus* of the *bhuta* known as fire, whereas the human body is *parthiva*; and no two *paramanus* of two different *bhutas* or of substances, created through effective conjunction of *paramanus* or parts of two different *bhutas*, can be proper parts or *avayavas* of the same single *eka bhautika dravya*. The eyes of a body are not even strictly speaking *upadana* in the sense of *samavayi karana*. They are better called *angas*. Thus *anga* of a created or gross substance is to be distinguished from the *avayava* of it. We need so far to distinguish between three types of situations. Two *paramanus* of the same *bhuta* may stand effectively conjoined as parts of an *avayavi dravya*. Two *paramanus* of two different *bhutas* or a number of bricks or a number of human bodies may be made into a heap in which these substances stand conjoined though not effectively. These are two extreme cases where terms conjoined stand respectively as intimately related and barely related. Conjunction, which obtains between the limbs of a body, or between certain limbs and the body of which they are the limbs, seem somehow to fall between the two extreme cases. A human body is called *deha indriya samghata*.

The conjunction between a body and the sense-organ is also causally effective – it is what makes sense experience of the soul possible – only it is not effective in the sense of bringing about another substance; in other words conjunction between a body and its sense-organ is not an instance of *dravyarambhaka samyoga*. Another instance of causally effective *samyoga* which is not *dravyarambhaka* is the conjunction between *manas*, not as the internal sense-organ but as the last of the nine substances, and soul. Like the conjunction between the *deha* and sense-organ this conjunction between soul and *manas* is effective in bringing about experience of sentient creatures like man. But there are instances of conjunction which are not effective in either of these two senses; take for instance the conjunction between *kala* and *ghata*. So far as we the finite beings are concerned, such conjunctions cannot even cause awareness of them as object. But in the case of a heap of unassorted substances the conjunction,

which accounts for this heap, is not effective in bringing about a new substance, or causing an experience, except of itself and as the object of the experience concerned.

An effective conjunction, which causes a new unit substance to occur, i.e., *dravyarambhaka samyoga*, obtains between either two *paramanus* of the same *bhuta* or two gross matter parts or *avayavas*, provided they are created out of the *paramanus* of the same *bhuta*. One question is why do the *naiyayikas* admit two types or levels of *dravyarambhaka samyoga*? Since much *samyoga* between two created matter, which are *avayavas* of the same *avayavi dravya*, presupposes necessarily and ultimately *dravyarambhaka samyoga* between *paramanus*, we could, it seems dispense with one of these two types of causally effective *samyogas*, which account for the material creation in the narrow sense of the term.

In the *nyaya* conception creation through combination is a process rather than an one-time single event or occurrence. If even all the actual-effect substances were created as a result of effective combination of the simplest material constituent or *paramanus*, then they would be produced in one go. In that case there would not have been a good rational explanation to why created substances do display different structural complexities. But once these complexities are hierarchically arranged, and we admit two types of *dravyarambhaka samyoga* and the corresponding two levels of creation, which may respectively be called, risking a small inaccuracy, micro and macro level creation – creation out of *paramanus* and creation out of smaller and less complex *avayavi dravyas* – we can account for what is experientially evident, namely, that substances of different structural complexities are there, and that the substances of higher and higher or more and more complex structures are produced gradually. But there seems to be a theoretical or conceptual difficulty here. If both *paramanu dravya* and *avayavi dravya* can be constituent or *avayava* of respective higher-order created substance, then the distinction of *dravyas* into those, which are *avayavin* and those which are not *avayavin*, becomes rather unnecessary complication. If on the other hand this distinction is to be maintained on independent and rational consideration, then the *nyaya* theory of gradual creation with level distinction should appear to have both rational and empirical support in its favour.

We shall argue in favour of the *nyaya* theory rather negatively. We shall show why we cannot say that no *avayava dravya* must itself be an *avayavin*, or that every *avayavin* must be an *avayava* of some actual or possible *avayavin* of higher complexities. If this can be shown then it will be demonstrated that there must be two types of *avayava* and two types of *avayavin*. If every *avayava dravya* were itself an *avayavin*, then it would itself be the result of effective combination of two or more *avayavas*; so far as each of these *avayavas* is itself an *avayavin*, it must be made out of further *avayavas*, each of which must be an *avayavin* of lesser structural complexity. If this logic is followed then every created substance will admit of being broken into parts or substances of lesser

and lesser structure *ad infinitum*. Every finite structure would be infinitely divisible. Apart from logical paradox of such a position the predictable observable consequence of it will be empirically disconfirmable. The predictable consequence of infinite divisibility of every created matter is that all material structures will be of same size. There will be neither measurable nor visible difference in size between a mountain and a mustard seed. Since the thesis of infinite divisibility of created matter is both logically inconsistent and empirically false, then the opposite thesis must be true. Analysis of matter must stop somewhere. The logical and physical end point of the analysis or breaking of a finite or created matter, in our language, *avayavin* or *janya dravya*, must be a unit matter which is not further divisible; it is *antya avayava*. However simple a structure must be the number of the *avayava* into which it can be broken, must be more than one. The number of *antya avayavas* into which any finite matter gets divided is usually very large. Be that as it may, the *antyavayavas* could not be *antyavayavas* if they were themselves *avayavins*. For then analysis of matter would not terminate with them. This therefore is the reason why we must admit some *avayava* or constituent matter, which are themselves not constituted by other matters of smaller structure. As such these are simplest and not further analysable matter. Though these *antyavayavins* have no *avayavas* of their own, they are themselves *avayavas*, i.e., constituent material structure or unit matter which are parts of other matter. These other matters by contrast have parts or *avayavas*, and as such they are *avayavins* or constituted matters; and since to be constituted in the sense of being brought about by effective combination of parts is to be caused, the *avayavins* are necessarily created matter.

There are a few theoretical problems here. A theory of creation is designed to explain the phenomenon of creation. But the phrase 'explanation of creation' is ambiguous in many ways. A theory may begin by accepting the phenomenon of creation, not just as a fact of experience but also as the starting point of theory building. For such a theory explaining creation may consist in answering the question, "What are the conditions which must have been realised in the past, as otherwise there could not have been the universe as we see it today?" If such a presupposition is granted, then we can begin by actual existence of structured and created matter and arrive at simplest matter, which is *paramanu* by physically and/or conceptually analysing or breaking matter till the end. If *paramanus* are arrived at in this way, then in the same act in which we prove the existence of such simplest matter as *paramanu*, we also prove that it is an *avayava* and hence *antyavayava*. But if in spite of granting full objective and experiential reality to the phenomenon of creation, one does not make its reality a presupposition of the theory of creation being developed, then explanation of creation cannot start from the acceptance of *avayavi dravyas*. It would not be a part of the meaning of simplest matter that it is *avayava* or *antyavayava*. We now see that the two parts of the meaning of *paramanu*, (i) that it is the simplest matter

or that it is not an *avayavin*, and (ii) that it is *avayava* or *avayava* of the least complex matter to be first created, are not analytically or necessarily related. So the question remains, though it did not surface because of the particular approach we adopted above, wherefrom comes the necessity for the partless and simplest units of matter to combine effectively? It is in its ability to answer this question posed in the way we have done just now that the utility and strength of a theory of creation seems to lie. Some theories which begin with this perspective takes the existence of matter or primordial matter or stuff to be a presupposition and limit of scientific explanation. The question under reference gains further strength in the *Nyaya* school of thought from the fact that the *naiyayikas* do not admit that everyone of the simple unit of matter is an *avayava*. They admit among the *bhutas akasa* which is as much partless as any *bhuta paramanu*, but *akasa* is not a constituent or part of any actual or possible created material substance. To put it differently, its being a *bhuta* or its being partless and hence structurally simple may not be enough to qualify or compel any unit of matter to be an *avayava*.

To return to the question we were discussing, why must one or must a *naiyayika* admit two types of *avayava* – one which is both an *avayava* and an *avayavin* and the other which is only *avayava* but not also an *avayavin*. It was argued that if infinite divisibility is an unacceptable position, and therefore if we are to accept only finite divisibility of gross or structured matter, then we must admit *paramanus* which are not *avayavins*. It was perhaps hoped that to be able to show this is to show that there are or must be admitted to be such matter, which are not *avayavin* but are nonetheless *avayava*. Then some doubt and critical points were raised to the effect that there may be other reasons for admitting uncreated and even simple substance, such that it would not necessarily follow that such substance, is an *avayava*. Thus the proof given so far in favour of the existence of partless substance, which is in itself part of some other substance, is not fully satisfying. Leaving this question unanswered and postponing another question to be raised shortly we may address ourselves to the other proof.

Let us admit for the present that we have proved that there are *avayavas* which are not *avayavin*. Let us now see if we can prove that there are *avayavins* which are *avayavas* also. There does not seem to be any necessity for a structured substance to be the part of another material substance. But if there is no logical inconsistency or empirical disconfirmation against the hypothesis that every *avayavin* must also be an *avayava*, then that may be thought to be enough. But we must remember that the *naiyayikas* do admit certain *avayavins* which according to them are not *avayava* in relation to any actual or possible complex matter. These they call *antyavayavin*. Secondly the pattern of proof we decided to offer compel us to find if and what argument may be there, why we cannot say that every *avayavin* is an *antyavayavin*. If

we cannot find any such argument, then we may have to end up so far with only two types of substance – the *bhuta paramanus* on the one hand, which are *avayavas* but not *avayavins*, and on the other the *avayavi dravyas* which are not *avayavas*. In that case there will not be two types of *avayava* but only one type. We have argued earlier if no *avayavin* were *avayava*, then every unit of matter of every degree of complexity would be constituted in the same way, directly by the *bhuta paramanus* standing in effective conjunction. Every created thing would be caused simultaneously. One way in which we can avoid this and make the observed succession among created things theoretically possible is to propose the hypothesis that material substances of higher, and more complex structure do not emerge till the substances of immediately lower degree of complexity are produced. If this is not to be a gratuitous assumption but a reasoned position, it is to be founded on some sound principle. One way of founding it in this sense is to make it a matter of causal necessity. If higher structures are causally dependent on lower structures, then gradually higher structures will be produced only temporally successively. Since at this level of creation of material substance 'causing' means effective combination of parts, gradually higher structures will be produced as a result of combination of preceding complex structures. The latter therefore must be parts or *avayavas*; and as complex structures they are *avayavins* also. So some *avayavins* are also *avayavas*. The question remains, why cannot all *avayavins* be like this or be *avayavas* themselves? Why there has to be higher limit of *avayava*? Why there must be *antyavayavin*? We shall leave this question unanswered here and say in conclusion that we have found, if not conclusive yet adequately convincing, argument why there should be *antyavayava* or *bhuta paramanu*, and why every *avayavin* cannot fail to be an *avayava*, or why every *avayavin* cannot be an *antyavayavin*. If however *antyavayavin* is at all admitted, then we find that matter would be available in four different forms. These four forms are, as the *naiyayikas* call them, (a) *antyavayava* e.g., *bhuta paramanus*, (b) *avayavins* which are also *avayavas* such as threads of a piece of cloth or pot halves, (c) *antyavayavins* such as a clay pot or jar or a piece of cloth, and lastly (d) the *bhuta dravya* which is neither an *avayava* nor an *avayavin*. *Akasa* is a case in point. This *akasa* is similar to *bhuta paramanus* in respect of being partless. It resembles *antyavayavins* insofar it never constitutes as part of another material body. It is easier to find a justification why *akasa* cannot be an *avayava*. No infinite substance can be a part of another material body, or we would have to admit a body which has a dimension greater than that of an infinite body. But this argument is not available in case of *antyavayavin* like a jar or earthenpot which has only a finite dimension. Existence of *akasa* renders another simpler and more neat classification of nine substances impossible. If *akasa* like other *bhutas* (or as it is more usual to call them *bhuta paramanus*) were *avayava* of some material body, or if it were not considered as a *bhuta*, then we could divide substances into those which inhere (in other matter which would be its part), or are *samaveta* and those which do not

inhere or are not *samaveta*. Then *asamaveta dravyas* could be divided into *bhutas* and those which are other than *bhutas* according to the principle, the former cause as constituent some created material body, while the latter type of *asamaveta dravya* do not form part of any other matter. All *samaveta dravyas* in that case would be *bhautika*, though all *asamaveta dravyas* would not be *bhutas*. As it is, while all *bhautika dravyas* are considered by the *naiyayikas* to be finite in dimension, *abhautika dravyas* whether *bhuta* or not include both the variety. Among the *bhuta dravyas akasa* is infinite, whereas other *bhutas* (or *bhuta paramanus*) are finite; among *dravyas* that are neither *bhuta* nor *bhautika manas* is finite but all the rest are infinite.

We have seen why we cannot accept the hypothesis of infinite divisibility of any complex bit of matter. But it has been pointed out that the other thesis of finite divisibility is not free from difficulty. In fact the Bauddha philosophers have argued that the *nyaya-vaisesika* conception of *paramanu* is inconsistent. But the way they argue brings it out clearly that they find fault not so much with the conception of a matter which is partless or simple, as with the conception that a piece of matter can be both partless and combine effectively with other (partless) matter to create or cause a material body having minimal complexity. They seem to argue that if *paramanus* were partless, then their conjunction could not constitute a larger material body. If parts to be combined are not infinitely small but have (however small) finite dimension, then we can distinguish between conjunction with one part from the conjunction with another part or matter. It can be visualized this way. We place a book *b* on the table or bring it in conjunction with the table then we place another book *b** on the first book. Because *b* has a finite dimension, it relates while it keeps separate the two — the table and the book *b**. We can say now that the book is the seat of two conjunctions or is conjoined with two substances on two sides of it. We could hardly say this if the *b* did not have any finite dimension or different sides so to say to be conjoined with different substances simultaneously. Greater the number of things with which a thing is simultaneously and directly conjoined, greater is the dimension of it. In other words a substance gains in dimension by the number of direct simultaneous and distinguishable conjunctions of which it is the seat. But the direct and simultaneous conjunctions to be distinguished, the thing which is the seat of these conjunctions must have finite dimension or parts. Different bodies parts or units of matter should be conjoined with different parts of the same thing; the thing must have different distinguishable points in its body where different particles of matter can touch it. This line of argument shows that if *paramanus* are to cause higher structure of matter to emerge through effective combination among themselves, then every single *paramanu* must have at least, as they say, six different points on its surface so to say; or it must have six parts or *sad amsa*. It is believed to be a very strong way of arguing against the notion of matter, which is the partless part of another matter which has not only a part but also a larger dimension, consisting in greater number of distinguishable and countable parts. The

nyaya reply to this objection is very subtle and extremely beautiful. The *naiyayikas* question a number of assumptions which remained unnoticed behind the Bauddha criticism. The Bauddhas have assumed that increase in dimension of material body is to be explained only in terms of addition of parts of lower dimension. This assumption is weak as it makes very difficult to take infinite magnitude to be objective. For infinite body on this view must be an infinitely divisible body. In other words the line of argument the Bauddhas offer to disprove partless *paramanu* has the consequence of making it necessary that every infinite substance is infinitely divisible. The weakness of this position is well-known from the time of Zeno or even before. Their second assumption that the only way to distinguish the direct and simultaneous conjunctions of which a certain body is the seat is to refer those conjunctions to different distinguishable parts of that body. It has been shown by the *naiyayikas*, how without referring them to different parts of the substance which is their seat, these conjunctions can be distinguished in terms of different direction or *dik*, which are related to the body in question, not as distinguishable parts of it but as what may be called different *avacchedakas*. A single partless *paramanu* can have different conjunction in different *dik avaccheda*. These are important points of technical detail which however we cannot discuss in this paper.